

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 32

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* GREGORY BREYTA, DANIEL J. DAWSON,  
MOAHMOUD M. KHOJASTEH, RANEE WAI-LING KWONG, ELWOOD H.  
MACY, DAVID P. MERRITT, WAYNE M. MOREAU, STANLEY E.  
PERREAULT,  
HARBANS S. SACHDEV, ROBERT L. WOOD and HIROSHI ITO

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Appeal No. 96-2105  
Application 08/059,861<sup>1</sup>

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ON BRIEF

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Before DOWNEY, OWENS and ROBINSON, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

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<sup>1</sup> Application for patent filed May 10, 1993. According to appellants, the application is a continuation of Application 07/864,721, filed April 7, 1992, now abandoned.

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This is an appeal from the examiner's final rejection of claims 1-17, which are all of the claims in the application.

*THE INVENTION*

Appellants' claimed invention is directed toward a process for forming a photoresist composition by stoichiometric carbonation of a polymer having hydroxyaromatic groups. The carbonation is carried out using a dialkyl dicarbonate in the presence of an unhindered tertiary amine catalyst selected from a recited group, and the reaction mixture does not contain more than 0.02 equivalents of an organic amine base per equivalent of dialkyl dicarbonate. Claim 1 is illustrative and reads as follows:

1. A process for the stoichiometric carbonation of a microlithographically useful polymer comprising hydroxyaromatic groups comprising the steps of

(a) mixing together in a reaction vessel

(1) a hydroxyaromatic material,

(2) a stoichiometric amount of a dialkyl dicarbonate to give the desired degree of substitution,

(3) a catalytic amount of an unhindered tertiary amine, wherein the amine is selected from the group consisting of

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amines comprising substituted and unsubstituted heterocyclic compounds, diethylmethyl amine, trimethyl amine, and polymers having unhindered amino groups, and

(4) a solvent

with the proviso that the reaction mixture does not contain an organic amine base in an amount exceeding 0.02 molar equivalents based on the dialkyl dicarbonate, and

(b) stirring the reaction mixture,

(c) precipitating the alkyl carbonate of the hydroxyaromatic material, and

(d) recovering the alkyl carbonate of the polymeric hydroxyaromatic material.

#### THE REFERENCES

##### *References relied upon by the examiner*

Brunsvold et al. (Brunsvold)<sup>2</sup> 4,931,379 Jun. 5, 1990

Hiroshi Ito, "Solid-State Thermolysis of Poly(*p-t*-Butoxycarbonyloxystyrene) Catalyzed by Polymeric Phenol: Effect of Phase Separation", 24 *J. Polym. Sci.* 2971-80 (Nov. 1986).

##### *Reference relied upon by appellants*

Jerry March, *Advanced Organic Chemistry* 361 (McGraw-Hill, 2d ed., undated).<sup>3</sup>

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<sup>2</sup> In the answer, the examiner incorrectly refers to this reference as "Brunswald".

<sup>3</sup> Appellants and the examiner have treated this undated reference as prior art, and we likewise do so.

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*THE REJECTION*

Claims 1-17 stand rejected under 35 U.S.C. § 103 as being unpatentable over Brunsvold in view of Ito.

*OPINION*

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with appellants that the aforementioned rejection is not well founded. Accordingly, we do not sustain this rejection.

We need only to address appellants' broadest claim, which is claim 1.

The portion of Brunsvold relied upon by the examiner is example 2A (col. 6, lines 16-48), in which poly(styrene-co-N-(4-t-butyloxycarbonyloxyphenyl)-maleimide is prepared from a reaction mixture of poly(styrene-co-N-(4-hydroxy-phenyl)-maleimide, 4-dimethylaminopyridine, di-t-butylpyrocarbonate, and triethylamine. The amounts of 4-dimethylaminopyridine and triethylamine used in this example are not disclosed.

Appellants point out (brief, page 7) that in Brunsvold's example 1A (col. 5, lines 5-46), 1.05 molar equivalents of an acylating reagent, i.e., isopropylchloroformate, and 1.05 molar equivalents of triethylamine are used. Appellants argue that "[t]he usual understanding in the art is to use an excess of acylating reagents and an excess of a base as a proton scavenger

to drive the reaction to completion" (brief, page 7). In support of this argument, appellants rely upon March, which discloses that in the alcoholysis of acyl halides, "[a] base is frequently added to combine with the HX which is formed", where X is a halide.<sup>4</sup> Appellants conclude that Brunsvold discloses the use of 4-dimethylaminopyridine only in admixture with triethylamine, wherein the amount of triethylamine is at least equivalent to the amount of the acylating agent (brief, page 8). Thus, in appellants' view, Brunsvold would not have fairly suggested, to one of ordinary skill in the art, use of

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<sup>4</sup> We do not find in the relied-upon portion of the reference a disclosure of use an excess of a base.

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a reaction mixture which contains no more than 0.02 molar equivalents of an organic amine based on the dialkyl dicarbonate.

Ito, which the examiner relies upon (answer, page 4) for motivation to form a copolymer of p-t-butoxycarbonyloxystyrene and p-hydroxystyrene, does not disclose use of an amine catalyst. The examiner argues that an acid is generated in Brunsvold's example 1A, whereas no acid is generated in Brunsvold's example 2B (answer, pages 5-6). Thus, the examiner argues, an excess of base would not be needed in example 2B to drive the reaction to completion (*see id.*).

Appellants do not challenge the examiner's argument that an acid is generated in Brunsvold's example 1A but not in example 2A. Nevertheless, the examiner's argument is not persuasive because the examiner has not provided any evidence or technical explanation as to why, if no acid is generated in Brunsvold's example 2A, Brunsvold includes triethylamine in the reaction mixture. Because the examiner has not set forth any evidence or technical reasoning as to what the function of the triethylamine is in Brunsvold's example 2A, the examiner has provided no basis for arguing that it would have been

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*prima facie* obvious to one of ordinary skill in the art to use no more than 0.02 equivalents of organic amine base per equivalent of dialkyl dicarbonate in that example.

Accordingly, we conclude that the examiner has not carried his burden of establishing a *prima facie* case of obviousness of the process recited in any of appellants' claims. Since no *prima facie* case of obviousness has been established, we need not address the affidavits of Khojasteh and Moreau. See *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); *In re Rinehart*, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

*DECISION*

The rejection of claims 1-17 under 35 U.S.C. § 103 over Brunsvold in view of Ito is reversed.

*REVERSED*

MARY F. DOWNEY )  
Administrative Patent Judge )  
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|        | TERRY J. OWENS              | ) | BOARD OF      |
| PATENT | Administrative Patent Judge | ) | APPEALS AND   |
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|        |                             | ) |               |
|        | DOUGLAS W. ROBINSON         | ) |               |
|        | Administrative Patent Judge | ) |               |

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Dale M. Crockatt  
IBM Corporation  
Intellectual Property Law Dept.  
1580 Route 52  
Hopewell Junction, NY 122533-6531

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